

On a new species of RENANTHERA.—By G. KING and D. PRAIN, Royal Botanic Garden, Calcutta.

[Read July, 3rd.]

Some years ago Lieutenant E. J. Lugard sent to the Calcutta Herbarium, for identification, some dried flowers and a living plant of what was evidently a species of *Renanthera*. The living plant unfortunately soon died in the uncongenial climate of Calcutta; the dried flowers were, however, sufficient to show that the plant probably belonged to a species near *R. coccinea*, Lour. Last year Lieutenant J. B. Chatterton was kind enough to send several plants of the same orchid to the Calcutta Garden, which were promptly transferred to the more suitable climate of the Cinchona Plantation in Sikkim. These plants flowered a few weeks ago and there is now no doubt that they belong to an undescribed species which from the resemblance of its flowers to the extended wings of a brilliantly coloured butterfly we now name *R. Papilio*. For a description of the flowers, drawn up from living specimens, we are indebted to Mr. R. Pantling, of the Cinchona Plantation, who has also made a beautiful coloured drawing of the plant.

RENANTHERA PAPILIO, n. sp. King and Prain. *Leaves* loriform, 2 to 2·5 in. long and about ·5 in. broad; their apices blunt and unequally lobed. *Inflorescence* 9 to 10 inches long, laxly racemose, or rarely paniced, on stalks of about equal length or longer, the bracts small, the stalked ovary about 1 in. long. *Dorsal sepal* linear-oblong, contracted below the blunt sub-cucullate apex, ·75 in. long. *Lateral sepals* twice as long as the dorsal, narrowly elliptic, flat, with undulate edges, the inner margins touching above the slender twisted claws; the apices sub-acute and divergent. *Lateral petals* ·5 in. long, spatulate, slightly incurved. *Lip* with acuminate-side lobes each with a small rounded basal auricle, the middle lobe broadly ovate, concave, its apex acute and pointing forwards, the base auricled. *Spur* short and blunt, with two erect toothed divergent plates near its mouth. *Column* minutely ciliate behind the anther; *stigma* with a thin deflected transparent lip.

Assam.

The colour of the flowers is a brilliant scarlet with a tinge of lake. The toothed plates of the spur end abruptly at the base of the middle lobe of the lip and immediately in front of their termination there are three blunt tooth-like processes. In its habit and the colour of its flowers the species resembles *R. coccinea*, Lour., but the flowers are larger and the lobing of the lip and the shape of the lateral sepals are very different.

On some New Orchids from Sikkim.—By G. KING and R. PANTLING.

The publication, in Sir Joseph Hooker's *Flora of British India*, of his account of the Orchids of the Empire marks an era in the study of this most interesting Natural Family. Prior to the issue of Sir Joseph's account of the group, it was extremely difficult to identify any Indian orchid that did not happen to have had a figure of itself published in some horticultural or botanical work. Now the work of determining the name of a species has been made comparatively easy; and the facilities which have thus been provided have stimulated local research. In the present paper we offer to the Society descriptions of thirty-three new species—twenty belonging to the Tribe *Epidendreae*, eight to the Tribe *Vandeeæ*, three to the *Neottieæ*, two to the *Ophrydeæ*—which have been discovered in Sikkim within the past few years.

Epidendreae.

MICROSTYLIS, Nutt.

MICROSTYLIS MAXIMOWICZIANA, n. spec. *Rhizome* 2 to 4 in. long, with scattered root fibres and bearing a leafy pseudo-bulb 3 or 4 in. long. *Leaves* 4 or 5, elliptic to elliptic-lanceolate, acute, tapering to the sheathing base, slightly oblique, 5 to 6 in. long. *Raceme* about 6 in long with numerous green flowers nearly .2 in. in diam., the stalk of the raceme 4 to 5 in. long. *Floral bracts* linear-lanceolate, equal to or exceeding the stalked ovary. *Sepals* oblong, blunt, their margins recurved, the lateral broader than the dorsal. *Petals* linear, all reflexed, the lip hood-shaped; its apex contracted, thickened and slightly crenate, and with two minute teeth above the pit; the side lobes sub-falcate, blunt. *Arms* of the *column* broad, overlapping and hiding the anther, the stigma occupying the whole face of the column. *Lip* of anther truncate.

Sikkim: On the Mungpoo Cinchona Plantation, alt. 2,000 to 4,000 feet; flowers in July.

The species is self-fertile.

OBERONIA, Lindl.

OBERONIA FALCATA, n. spec. *Stems* caulescent, tufted, 3 in. long. *Leaves* falcate, acute 1 to 2 in. long, and .25 in. broad. *Racemes* almost sessile, erect, 2 to 3 in. long; the flowers yellowish-green, minute, very numerous and sub-verticillate. *Flower-bract* ovate, erose, equal to and sheathing the stalked ovary. *Sepals* broadly ovate, entire, reflexed. *Petals* linear-oblong, blunt, entire. *Lip* twice as long as

the sepals, broadly oblong, flat except for a slight depression below the column; the side lobes short, subulate, spreading; the apex deeply bifid, the lobes oblong-acute, slightly divergent at their apices. *Column* with two fleshy wings. *Anther* membranous; the pollinia ovate, flattened and of a dark orange colour.

Sikkim: at Labha, elevation about 6,000 feet? In flower in July. (Both locality and elevation are however doubtful).

This belongs to same group as *O. caulescens*, Lindl. and *O. Wightiana*, Lindl.

OBERONIA LONGILABRIS, n. spec. *Stems* caulescent, slightly tufted, erect, slender, 2 to 3 in. long. *Leaves* narrowly ensiform, acute, 1 to 1.5 in. long, and .2 in. broad. *Racemes* slender, 2.5 to 3.5 in. long, nodding; their stalks .5 to 1.25 in., ebracteate. *Flowers* minute, rather sparse, green. *Bract* lanceolate, erose, much exceeding the stalked ovary. *Sepals* ovate, entire. *Petals* linear, blunt. *Lip* oblong, three times as long as the sepals, with two small rounded lobes at the very base, the apical lobes broadly lanceolate, sub-divergent, acute, the sinus apiculate, the surface of the lip with a lanceolate depression extending from near the sinus to the column and there becoming deeper. *Column* with small stout wings. *Pollinia* orange.

Sikkim: at Songchongloo, elevation 6,000 feet; in flower in July.

A species near *O. caulescens*, Lindl.

OBERONIA MICRANTHA, n. spec. Acaulescent, height of whole plant 2.5 inches. *Leaves* narrowly-ensiform, sub-acute, .5 to 1.5 in. long, and from .1 to .15 in. broad. *Racemes* about 1.25 in. long, on very short bracteate stalks. *Flowers* numerous, very minute, verticillate. *Bracts* linear-lanceolate, erose, equal to or slightly exceeding the ovary. *Sepals* broadly ovate, entire, spreading, minutely papillose externally. *Petals* narrower than the sepals, ovate, entire, recurved. *Lip* in general outline sub-rotund divided into a basal and apical part by deep lateral sinuses: the basal part concave, fleshy, its edges almost entire; the apical part transversely elliptic, thinner than the basal, with an acute apiculus and irregularly erose-dentate edges.

Sikkim: at Tendong, elevation 6,000 feet; in flower in July.

The nearest allies of this very distinct little species are *O. myriantha*, Lindl. and *O. demissa*, Lindl.

OBERONIA PARVULA, n. spec. Acaulescent, not tufted or very slightly so: the height of the whole plant 1.25 to 2 in. *Leaves* two or three, .5 to nearly 1 in. long, and .12 to .25 in. broad, lanceolate, acute. *Raceme* .75 to 1 in. long, on a slender stalk about half as long. *Flowers* very minute, densely crowded, not verticillate. *Bract* lanceolate, as long as the stalked ovary. *Sepals* ovate, entire, the laterals larger

and wider-spreading than the dorsal, and keeled. *Petals* linear, truncate, shorter than the sepals, entire, pale yellow and transparent like the sepals. *Lip* reddish brown, with broad reniform base having a lateral sinus and a short convergent horn at each side at its anterior end: the apical lobe broadly oblong, deeply bifid, the lobes lanceolate and slightly convergent, and the sinus narrow, not triangular and with a concave emarginate apex. *Stigma* concave.

Bhotan: at Guru-bathan, at an elevation of about 1,500 feet; in flower in February.

A very distinct species.

OBERONIA LOBULATA, n. spec. Acaulescent, not tufted. *Leaves* about four, large, oblong, sub-acute, 1.25 to 3 in. long, and .4 to .5 in. broad. *Raceme* 4 in. long, on a winged ebracteate peduncle about half as long, much decurved. *Flowers* distant, minute, green. *Bracts* broadly oblong, the apex convex and minutely erose equalling and sheathing the sessile ovary. *Sepals* ovate, acute, entire, reflexed; the *petals* similar but narrower. *Lip* broadly triangular with irregularly erose margins, the apex with a broad shallow sinus and two short blunt lobes. *Stigma* convex?

Sikkim: in the valley of the Teesta, at an elevation of about 1,000 feet; in flower in October.

Collected only once. A remarkable species with the pollinia encased within the anther cells and not free as is usually the case in the genus *Oberonia*.

OBERONIA PRAINIANA, n. spec. Acaulescent, and slightly tufted. *Leaves* very fleshy, falcate, sub-acute, .5 to .75 in. long, and .25 in. broad. *Raceme* slender, many times longer than the leaves, erect, 4 in. long: stalk of the raceme attached to the uppermost leaf, minutely bracteolate, filiform, about 1 in. long. *Flowers* of a warm brown colour, verticillate, very minute. *Bract* oblong, sub-entire, equal to and embracing the stout sessile ovary. *Sepals* oblong, blunt, all much revolute. *Petals* elliptic-lanceolate, spreading, deeply serrate. *Lip* triangular-oblong with a circular nectar-bearing pit near its base and under the column, the apex blunt, the margins deeply erose-dentate. *Pollinia* 2 pairs, orange-coloured.

Sikkim: in the Teesta Valley, at an elevation of about 1,000 feet; in flower in July.

A very distinct species remarkable for the great length of the slender inflorescence in proportion to the leaves, and for its unlobed but deeply erose dentate lip.

DENDROBIUM, Swartz.

DENDROBIUM COESPITOSUM, n. spec. Pseudo-bulbs tufted, narrowly conical, from .5 to 1 in. long. *Leaves* linear-oblong; the apex sub-obtuse, minutely and obliquely emarginate, about 1.5 in. long and .25 in. broad. *Racemes* terminal 1 to 2 in. long, the rachis slender, minutely bracteolate, 8- to 12-flowered. *Sepals* and *petals* sub-equal, narrowly lanceolate acute, .25 in. long, slightly spreading. *Lip* slightly shorter, fleshy obovate-oblong, decurved at the base, otherwise flat, without lateral lobes, the margins ciliolate near the base; disc much thickened and deeply 3-grooved; mentum concave. *Anther* papillose; *pollinia* thin.

Sikkim: in the Naru Valley, at an elevation of 6,000 feet; in flower in June.

This species belongs to the group *Stachyobium* and is allied to *D. alpestre*, Royle, but that species has a lip with incised-serrate lateral lobes, a small crisped terminal lobe, and a central bi-lamellate disc. It is also allied, but not so closely, to *D. ericeflorum*, Griff.

DENDROBIUM PAUCIFLORUM, n. spec. Stems 2 to 3 feet long, as thick as a goose-quill, branching, and tapering towards each extremity, pendulous, smooth when young but slightly grooved when old. *Leaves* linear-lanceolate, obliquely and minutely emarginate at the apex 3 to 4 in. long, and .5 to .75 in. broad. *Racemes* lateral about .5 in. long, 1-4-flowered; flower-bract ovate, blunt .1 in. long. *Flowers* .75 in. long. Lateral *sepals* ovate; the dorsal narrower, blunt. *Petals* ovate-lanceolate, ciliolate. *Lip* .5 in. long, oblong, clawed: basal lobes narrow, directed forwards, fringed, the part between these lobes much thickened and bearing on its surface 3 raised lines; terminal lobe flat, hispid with no central thickening or lines; *mentum* with a large nectar-secreting chamber, its upper (posterior) portion partially covered by the wings from the sides of the column.

Sikkim above Engo, at an elevation of about 4,000 feet; in flower in June.

The flowers are of a golden yellow colour, the sepals and petals being broadly margined with crimson. The apical lobe of the lip is spotted with red. Its nearest ally is probably *D. sphegidoglossum*, Reichb. fil. The position of the basal lobes of the lip is so far forward that they are really not basal but lateral.

BULBOPHYLLUM, Thouars.

BULBOPHYLLUM CORNU-CERVI, n. spec. Pseudo-bulbs globular, touching, only .1 in. in diam. *Leaf* coriaceous, sub-sessile elliptic or elliptic-rotund tapering slightly to the base, 1 to 1.5 in. long and .6 to .8 in. broad. *Raceme* 1.4 to 1.75 in. long, on a sub-erect stalk rather longer

and stouter than itself and bearing at intervals a few minute bracteoles. *Flowers* rather distant, about .25 in. long. Dorsal *sepal* oblong, blunt, lying parallel to the column; the laterals broader, flat, with involute margins. *Petals* half as long as the sepals, lanceolate, 1-nerved (in fresh flowers). *Lip* fleshy, sub-rotund with lateral sinuses; the basal portion thick concave; the anterior portion thinner and much deflexed so that its upper surface is convex, the edges entire. *Column* very short, with stout 2-3-fid arms variable in shape; *mentum* flat, narrowing outwards, with a stout raised mesial line which begins as a hook at the lower margin of the stigma. *Anther* flat; *pollinia* small.

Sikkim: near the base of the Engo ridge at an elevation of probably about 2,500 feet: flowering in July.

The sepals of this are green with reddish-brown margins; the lip is yellow with a touch of dull red at the base. The nearest ally of this seems to be *D. alcicorne*, Par. & Reichb. fil.

BULBOPHYLLUM CLARKEANUM, n. spec. *Rhizome* long, about the thickness of a crow-quill, sending up at intervals of about an inch and a half, ovoid-globose obtuse pseudo-bulbs .35 to .6 in. long. *Leaf* narrowly elliptic, slightly notched at the apex, sessile, about 1 in. long and .5 in. broad. *Scape* .5 to 1 in. long, slender, with 3 to 5 small sheaths 2-3-flowered. *Flowers* .3 in. long, their pedicels .2 in. long, borne at the apex of the scape. *Sepals* sub-equal, lanceolate-acuminate, their apices thickened. *Petals* about one-third of the length of the sepals, broadly ovate, obtuse, 3-nerved. *Lip* ovate, acute, decurved, the upper surface convex with an elongated central pit; the edges thin erose. *Column* with long projecting spurs.

Western Doar of Bhutan; in the Kumai Forest near the Jaldacca River, at an elevation of about 1,500 feet: flowering in June.

This is allied to *B. stenobulbon*, Par. & Reichb. fil., but has different pseudo-bulbs and leaves.

BULBOPHYLLUM CYLINDRICUM, n. spec. *Rhizome* long, creeping, .1 in. thick, with numerous sheaths towards the apex, bearing at distances of about two inches cylindric pseudo-bulbs truncate at the apex and 1 to 1.25 in. long. *Leaf* narrowly oblong, sessile, blunt, faintly notched at the apex, 2.5 to 3 in. long, and .4 to .5 in. broad. *Scape* about as long as the pseudo-bulb, slender, minutely bracteolate. *Flowers* 3 to 5, sub-umbellate, about .25 in. long. *Sepals* lanceolate, caudate-accuminate, the dorsal shorter than the laterals. *Petals* about one-fourth of the length of the lateral sepals, ovate, sub-acute, 1-nerved. *Lip* oval, blunt, flat, its margins thin, entire, much reflexed. *Column* very stout, with short spurs; *mentum* conical. *Anther* with a raised fleshy mid-area, its lip truncate; *pollinia* divergent.

Sikkim: Mungpoo, at an elevation of about 3,000 feet: flowering in June.

This is also closely allied to *B. stenobulbon*, Par. & Reichb. fil. of which it has the leaves and pseudo-bulbs, but the flowers are different. It is likewise allied to *B. Clarkeanum*.

BULBOPHYLLUM EBULBUM, n. spec. *Rhizome* .15 in. thick, smooth, bearing leaves at distances of three or four inches. *Pseudo-bulbs* none. *Leaves* with long petioles, the blades oblong-lanceolate, tapering to base and apex, about 7 in. in length and 1 to 1.25 in. broad: *petiole* 1.5 to 2 in., channelled. *Raceme* erect, rising immediately in front of a leaf, many-flowered, about 3 in. long, its stalk about half as long, bracteate. *Flowers* rather distant, .25 in. long. *Sepals* lanceolate, acuminate, (1-nerved?), the dorsal shorter. *Petals* linear-lanceolate, 1-nerved, half as long as the lateral sepals. *Lip* oblong, stipitate, deflexed from the middle, blunt, entire, longer than the lateral petals. *Column* stout, with mentum twice as long as itself and bearing a large swelling below the stigma. *Anther* thickened down the centre, entire.

Sikkim: at Sivoke, elevation 1,000 feet; in flower in July.

The nearest ally of this is undoubtedly *B. apodum*, Hook, fil. from which it is however well separated by the shape of the leaf, and the non-auriculate lip.

BULBOPHYLLUM LISTERI, n. spec. *Pseudo-bulbs* oblong-ovate, compressed, .35 in. long, arranged alternately and close together on a thread-like rhizome. *Leaf* fleshy, linear-oblong; sub-acute, sessile, 1 to 1.5 in. long. *Flowers* .125 in. long, solitary from the bases of both old and new pseudo-bulbs, and much shorter than the latter, the shortly-stalked ovary enveloped by several shrivelled bracts. *Dorsal sepal* ovate-lanceolate, blunt; the laterals a little longer, cohering by their lower margins nearly to the tips and forming a kind of trough in which the lip lies, their margins ciliolate. *Petals* fleshy, ovate, erose at the apex, minutely ciliolate in the middle. *Lip* lanceolate almost flat, the apex alone slightly decurved, the base constricted into a short claw, the upper surface with a thickened yellow mesial line. *Column* very short, its spurs long, slender, up-curved. The galeate *anther* with a filiform attachment to the column.

British Bhotan: at the Rumpti Lake, elevation 1,000 feet: flowering in March.

This remarkable species was discovered by Mr. J. L. Lister, of the Bhotan Cinchona Association, who gave it to Mr. Pantling. It is one of the most curious in the whole genus. The flowers are of a dull lake.

CIRRHOPETALUM, Lindl.

CIRRHOPETALUM DYERIANUM, n. spec. *Rhizome* .1 inch thick. *Pseudo-bulbs* ovoid-globose, .35 to .5 in. long, touching or from .25 to .5 in. apart. *Leaf* fleshy, elliptic, blunt, sessile. *Scape* 2.5 in. long, filiform, pendulous, bracteolate only at the base, bearing 3 or 4 rather distant racemose flowers .65 in. long, each with a lanceolate acuminate basal bract equally the slenderly pedicelled ovary. *Dorsal sepal* ovate, acute, the laterals two and a half times as long, linear-oblong, acuminate, slightly oblique, and somewhat incurved at their apices but not cohering. *Petals* equal to the dorsal sepal in length, ovate, acute, erose. *Lip* narrowly triangular with a deep mesial groove to near the apex. *Column* with short up-curved spurs; *mentum* twice as long as the column. *Anther* minutely papillose.

Sikkim: on the summit of Tendong, elevation 7,000 feet; in flower in August.

CIRRHOPETALUM SARCOPHYLLUM, n. spec. *Rhizome* .15 in. thick, bearing at intervals of 3 or 4 inches small flat disc-like pseudo-bulbs, .35 in. in diam. *Leaf* 4 to 9 in. long, pendulous, very coriaceous, oblong-lanceolate, sub-falcate, without visible nerves, contracted at the base to a thick cylindric petiole .75 to 1 in. long. *Scape* 3 or 4 in. long, pendulous, with a few equidistant ovate-lanceolate acute sheathing bracts .25 in. long and bearing at its apex an umbel of 3 to 7 shortly stalked flowers .75 in. long. *Dorsal sepal* ovate-acuminate .35 in. long, the laterals narrower, and twice as long, cohering for one-third of their length, free at the tips, glandular-puberulous. *Petals* oblong, falcate, acute .2 in. long. *Lip* tongue-shaped, channelled below. *Column* with slender divergent spurs with a smaller tooth at the base of each: *mentum* stout with two parallel central raised lines. *Lip* of *anther* recurved. *Pollinia* cuneate.

Sikkim: at Rishap, elevation about 2,500 feet; in flower in September.

The flowers are purplish speckled with yellow.

CHRYSOGLOSSUM, Blume.

CHRYSOGLOSSUM MACROPHYLLUM, n. spec. *Pseudo-bulb* sub-cylindric, thin, 6 in. long. *Leaf* plaited, oval, slightly narrowed at base and apex, 15 in. long and 7 in. broad: its petiole 8 in. long. *Raceme* about 6 in. long, many-flowered, its stalk about 12 in. long, sparsely bracteolate: *Flowers* .5 in. across, their ovaries .5 in. long, bracts lanceolate, reflexed, shorter than the ovaries. *Sepals* sub-equal, the dorsal lanceolate, the laterals falcate. *Petals* slightly broader than the sepals, falcate. *Lip* contracted into a claw at the base, mobile, oblong, abruptly decurved from

the rounded basal lobes, the apex minutely emarginate and decurved: upper surface with two bold longitudinal minutely hispid lamellae running from the base to nearly the apex where they unite. *Mentum* half as long as the entire column. *Anther* with two projecting triangular wings. *Pollinia* 2, attached to a small viscid disc.

Sikkim: in the Chel valley, at an elevation of 4,000 feet; in flower in May.

This differs from any *Chrysoglossum* known to us in having a wingless column. The flowers have an unpleasant smell.

ERIA, Lindl.

ERIA FIBULIFORMIS, n. spec. *Pseudo-bulbs* crowded and often overlapping, much depressed, reticulate, .5 in. in diam. *Leaves* membranous, in pairs, oblanceolate, sub-acute, sessile, the edges minutely ciliolate, 1.75 in. long. *Flowers* in pairs, .25 in. long, their ovaries short, sigmoid, sub-campanulate. *Sepals* united to form a 2-lipped beaked sac, gibbous at the base. *Petals* oblong-lanceolate, sub-acute, obliquely curved, not quite so long as the calyx, their apices connivent above the very small lip, (1-nerved?). *Lip* half as long as the petals, clawed at the base, its upper surface concave, the side lobes broad and rounded, the part beyond them contracted and with laciniate edges, the apex carunculate, a small retrose callus in front of the basal claw. *Mentum* twice as long as the column, tapering downwards. *Rostellum* very large and resting on the two lobes and upper margin of the stigma. *Anther* crested and tuberculate, its lip erose. *Pollinia* 8, barely cohering by their minute membranes.

Sikkim: in tropical valleys at the base of the hills, at Sivoke, &c.: in flower in October.

This belongs to the section *Porpax* and is allied to *E. Lichenora*, Lindl. and *E. ustulata*, Par. & Reichb. fil. Its sepals are united to form a curious 2-lipped sac, sparsely hispid externally. All parts of the flower are of a uniform dull red colour.

TAINIA, Blume.

TAINIA HOOKERIANA, n. spec. *Pseudo-bulbs* ovoid, tapering upwards, 2 to 3 in. long, rising close together from a stout rhizome, and enveloped in a bract which sheaths also the petiole nearly to its apex. *Leaf* plicate, oblong-lanceolate, tapering much to each end, 12 to 18 in. long and about 3 in. broad, its petiole somewhat shorter. *Raceme* about 10 in. long, its stalk about twice as long, glaucous, bearing two or three sheathing bracts near the base: floral bracts lanceolate, .25 in. long. *Flowers* about 1 in. long, their ovaries .75 in. *Sepals* and

petals sub-equal, lanceolate, acuminate. *Lip* oblong with rather large blunt incurved side-lobes and a dilated sub-reniform apex apiculate in the centre; upper surface of the middle of the lip with 3 ridges which, beginning at the base as lines, pass into converging lamellae towards the apex; spur blunt, incurved, exceeding the sepals by .12 in. *Column* winged. *Anther* with two bosses.

Sikkim; in the valley of the Teesta at an elevation of 1,000 feet; in flower in March.

The colour of the sepals and petals is greenish with brown lines: the lip is white, and its lamellae are yellow spotted with pink. The anther is pink and its bosses are dark red. The species is near to *T. viridifusca*. We have dedicated it to Sir Joseph Hooker.

CALANTHE, R. Br.

CALANTHE TRULLIFORMIS, n. spec. *Leaves* linear-lanceolate, acute, sessile, 9 to 12 in. long. *Raceme* about 9 in. long; its stalk about the same length, puberulous. *Flowers* 14 to 18, scattered, about 1 in. in diam.; floral bracts linear-lanceolate equal to or exceeding the stalked puberulous ovaries. *Dorsal sepal* ovate-lanceolate, narrowly acuminate .75 in. long; *lateral sepals* lanceolate, falcate, longer than the dorsal. *Petals* linear, acute, shorter than the lateral sepals. *Lip* sessile, trowel-shaped, the base entire, the sides irregularly crenate-dentate, not lobed; the apex acuminate, entire: the upper surface with two converging lamellae extending from its base midway to the apex: *spur* short, stout; its mouth triangular, its interior bristly. *Pollinia* in 4 clavate unequal pairs.

Sikkim: on Mahaldaram Peak: elevation 6,000 feet; flowering in in July.

A species allied to *C. puberula*, Lindl. but differing from that species in having sessile leaves and a lip without side lobes. The colour of the sepals and petals is brown with a mesial and marginal green lines. The lip is white, with a triangular pink mark at the base.

Vandææ.

EULOPHIA, R. Br.

EULOPHIA GENICULATA, n. spec. *Leaves* about three and a half feet in length of which the petiole forms one-third, the blade linear-lanceolate, acute, plicate. Flowering *scape* about 18 in. long, clothed throughout with sheathing bracts 1 to 3 in. long, and bearing at its apex a 6- to 8-flowered raceme. *Flowers* 1 in. in diam., each with a lanceolate acute bract equalling the sub-sessile, cylindric ovary. *Dorsal sepal* elliptic, blunt: the two lateral elliptic-lanceolate, sub-acute.

Petals oblong, blunt, shorter than the sepals, connivent over the column. *Lip* oblong, with long shallow side-lobes, its body as far as the end of the side lobes with three to five parallel thickened nerves which end beyond the extremities of the side-lobes in a carunculate area on the truncate apical lobe: spur geniculate, short. *Anther* with a small 2-lobed lip.

Sikkim: in the valley of the Teesta: elevation about 1,000 feet: flowering in August.

The sepals of this are brown, the petals and lip pale yellow. The petioles of the two leaves form a pseudo-stem rather shorter than the scape, and they are enclosed within two sheaths about 9 inches long. This pseudo-stem is bound to the scape near its base by two short broad sheaths which originate from the tuber. The nearest ally of the species is *E. lachnocheila*, Hook. fil.

CYMBIDIUM, Swartz.

CYMBIDIUM MUNRONIANUM, n. spec. Terrestrial. *Leaves* stiff, erect, ensiform, 16 to 20 in. long and .75 in. broad, tapered into a petiole or not. *Racemes* stout, erect, about one foot long, about half being stalk, with two or three distant closely embracing sheaths 1 in. long. *Flowers* about 7 or 8, distant, 1 in. in diam., their bracts .25 to .35 in. long, lanceolate. *Sepals* and *petals* sub-equal, oblong-lanceolate, acute. *Lip* lanceolate (when flattened out), everywhere concave on the upper surface; the lateral lobes elongate and shallow, the body with two parallel smooth lamellæ in its centre ending with the side-lobes, the apical lobe narrow and reflexed. *Pollinia* 4, plano-convex, the gland narrow.

Sikkim: in the Teesta Valley on dry knolls: at an elevation of 1,500 feet: flowering in May.

The flowers of this species are sweetly-scented: the sepals and petals are straw-coloured and each has 5 dotted or streaked lines: the lip is white except its apical lobe, which is pale yellow transversely blotched with red. Its nearest ally is *C. ensifolium*, Swartz, under which it appears to be included by Lindley and other authorities. This Sikkim plant appears to us to differ very materially from the true Chinese *C. ensifolium*. We have dedicated the species to the late Mr. James Munro, for many years resident in Sikkim, and well-known, not only as a lover of plants, but as a man of great sincerity, and of unlimited kindness and hospitality.

CYMBIDIUM SIMONSIANUM, n. spec. *Leaves* linear, sessile, the apex acute and sub-oblique: length 3 feet or more: breadth .4 in. *Raceme* 8 in. long, pendulous, shortly stalked, sheathed at the base by large

imbricate bracts 1 to 2.5 in. long. *Flowers* about 10 to 12, sparse, their bracteoles very short. *Sepals* sub-equal, linear, slightly wider near the apex, about 1 in. long. *Petals* rather shorter than the sepals, connivent round the column. *Lip* with long shallow erect blunt entire side-lobes parallel with, and as long as, the column; the apical lobe ovate, apiculate, deflexed; lamellæ of the lip 2, stout, parallel, clothed with glandular hairs, ending abruptly with the basal lobes but continued partly into the apical lobe as thickened lines. *Pollinia* falcately ovoid, compressed; the gland large.

Sikkim: in the valley of the Teesta: elevation about 1,000 feet. Assam: locality unknown; flowers in August.

The flowers of this species are sweet-scented: the sepals and petals are white with a crimson central line; the lip is also white, but has oblique crimson lines on the lateral lobes, with large blotches of the same colour on the apical lobe: the column is of a very dark crimson, and the anther of a pale yellow colour. Specimens of this plant were sent many years ago from Assam by the late Dr. J. C. Simons, to whom the Calcutta Herbarium is indebted for numerous contributions of plants, and for a large number of drawings of orchids. The species is now dedicated to his memory.

CYMBIDIUM GAMMIEANUM, n. spec. *Leaves* linear, slightly narrowed to the base, the apex acute, 2 to 3 feet long and about .75 in. broad. *Raceme* pendulous, about 12 in. long with a stalk about three-fourths as long, laxly or densely-flowered, the bracteoles minute, the stalk enveloped in large imbricate sheaths 3 to 4 in. long. *Sepals* linear-lanceolate or linear-oblong, 7-nerved, 1.5 to 1.75 in. long and about .45 in. broad. *Petals* linear-oblong, sub-falcate, slightly shorter than the sepals, 7-nerved. *Lip* about as long as the sepals, oblong, the side lobes shallow, elongate, acute, the apical lobe sub-orbicular undulate, puberulous, separated from the lateral lobes by a sinus; lamellæ of the lip 2, pubescent, parallel, but meeting and ending abruptly with the side lobes opposite the ciliolate sinus. *Column* slender, slightly winged. *Capsule* 2 in. long.

Sikkim: at elevations of from 5,000 to 7,000 feet: flowering in September and October.

The colour of the flowers in this species is a dirty yellow: the lip is of a brighter yellow and has brown lines on its side lobes. Individuals with flowers of a paler yellow are however very common, and these have usually densely-flowered racemes like *C. elegans*, Blume; while the plants with dirty yellow flowers have lax racemes suggestive of those of *C. longifolium*, Don. This species, although common in Sikkim; has hitherto remained un-named. We dedicate it to Mr.

J. A. Gammie, Deputy Superintendent of the Government Cinchona Plantation in Sikkim, whose work in the cultivation of the medicinal species of *Cinchona* and in the local manufacture of Quinine is so well-known and so highly appreciated. The species is allied to *C. Mastersii*, Benth. and *C. affine*, Warn.

SARCOCHILUS, R. Br.

SARCOCHILUS RETRO-SPICULATUS, n. spec. Leafless; the roots large, numerous and flat. *Scape* about .75 in. long, bearing at its apex 1 or 2 green, minutely bracteolate flowers .2 in. long. *Sepals* and *petals* sub-equal, linear-lanceolate, wide-spreading, the laterals inserted on the sides of the lip. *Lip* sessile, linear-lanceolate, the apex with a retrorse tooth; the base sub-gibbous, side lobes none: the spur globose, its mouth contracted. *Column* very short. *Pollinia* 4: the caudicle short, dilated below the pollinia, the gland ovate.

Sikkim: at elevations of about 5,000 feet; flowering in June.

A very inconspicuous species, remarkable for the curious retroflexed apical spicule-like appendage of the lip.

SARCOCHILUS CREPIDIFORMIS, n. spec. A minute leafless plant with comparatively large spreading roots. *Raceme* erect, .35 in. long, flowers .15 in. long, bracteate, distichous, opening singly. *Sepals* sub-equal, ovate, blunt. *Petals* shorter than the sepals, lanceolate. *Lip* sessile on the column, forming a roundish cup with entire edges, about equalling the dilated horizontal spur which is pilose just inside its mouth. *Column* very short. *Anther* thin, with a slightly deflexed fleshy lip. *Pollinia* 4, all attached to a single thread-like caudicle: gland ovate. *Ovary* long, sub-sessile: *fruit* 1 in. long, cylindric.

Sikkim: in tropical valleys: flowering in September.

The sepals and petals of this curious little plant are greenish, the lip is white, and the stigma has purple margins. It is named from the resemblance of the combined lip and spur to a slipper or last.

SARCOCHILUS BIMACULATUS, n. spec. *Stem* very short. *Leaves* linear-oblong, narrowed to the base, sub-falcate, the apex obliquely bifid, 2 in. long, and .35 in. broad. *Raceme* stout, .75 in. long, compressed, and with persistent triangular bracts. *Flowers* confined to the upper half of the rachis, distichous, .3 in. in diam., sessile. *Sepals* sub-equal, ovate-lanceolate, apiculate, the laterals attached to the base of the column. *Petals* shorter than the sepals, ovate, sub-acute. *Lip* springing at right angles from a short mentum, and lying parallel to the column; its side lobes narrow, elongate, falcate, acute at the apex: apical lobe triangular, very fleshy and with two flat calli at its base where the side lobes end: the centre of the body of the lip with larger elongate calli

near its union with the mentum. *Stigma* large. *Rostellum* small. *Pollinia* ovoid, the caudicle oblanceolate; the gland very small, ovoid. *Capsule* 1.5 in. long, triquetrous.

Sikkim: in the valley of the Teesta; elevation about 1,500 feet: flowering in July.

The flowers are white, with two blotches of brown on the calli of the lip. They open singly and smell of almonds.

SACCOLABIUM, Blume.

SACCOLABIUM PSEUDO-DISTICHUM, n. spec. *Stems* slender, 6 to 9 in. long, slightly branching. *Leaves* fleshy, lanceolate, the apex finely and minutely bifid, .5 to .75 in. long, and .2 to .25 in. broad. *Peduncle* .35 in. long, sub-umbellately 5- or 6-flowered. *Flowers* .3 in. in diam. bracts minute. *Sepals* and *petals* sub-equal, oblanceolate-oblong. *Lip* with a wide hemispheric spur; side lobes absent; terminal lobe broadly cordate, blunt, entire, fleshy, concave, deflexed, quite without callus. *Column* very short. *Pollinia* 2, entire, ovoid-globose; gland deeply 2-lobed.

Sikkim: at elevations of 6,000 to 8,000 feet: flowering time August to October.

This grows along with *S. distichum* Lindl. to which it is closely allied. As in that species the sepals and petals are greenish or yellowish with purple spots; the lip in this is yellow, except the terminal lobe which is orange. The chief distinction between the two is to be found in the lip which, in this, is entirely without calli of any kind; while, in *S. distichum*, the lip has two large calli situated at its base. The times of flowering of the two are moreover separated by three months.

Neottieæ.

CHEIROSTYLIS, Blume.

CHEIROSTYLIS FRANCHETIANA, n. spec. *Roots* short tubercular. *Stem* 6 to 9 in. long, the nodes slightly swollen. *Leaves* few, scattered, glabrous; linear-lanceolate and much reduced in the flowering plant; in the young plant .25 to .35 in. long, ovate and shortly petiolate. *Raceme* pubescent, 1- to 2-flowered. *Flowers* .25 to .3 in. long, with ovate bracts shorter than the ovary. *Sepals* oblong, curved, connate for one-third their length; the dorsal concave, shorter than the laterals. *Petals* broad, sub-quadrate, with an oblique central nerve. *Lip* slightly exceeding the sepals, abruptly deflexed from a saccate base; the limb very shortly clawed, deeply divided into two linear obliquely sub-acute rather divergent lobes. *Column* with two pyriform processes

immediately beneath the rostellum. *Anther-beak* decurved. *Pollinia* sub-obovate, divergent when released from the anther; the caudicle acuminate and the gland oblong.

Sikkim: above Sureil; elevation 6,500 feet: flowering in August.

A very distinct species, named in honour of M. Franchet, the distinguished French Botanist who has so successfully elaborated the extraordinarily rich collections made by the Abbé Delavay in the highlands of South-Western China.

GOODYERA, R. Br.

GOODYERA HEMSLEYANA, n. spec. Height of entire plant 6 to 10 in. of which 3 in. are spike: roots few, thick. *Leaves* 3 to 5, scattered, unequal, broadly ovate, acute, glabrous like the stem, dark green with white nerves .8 to 1.8 in. long and .5 to 1 in. broad. *Flowers* subsecund, .5 in. long, the bracts equalling the ovaries. *Sepals* 3-nerved, white with pink lips, the laterals ovate-acuminate, the dorsal oblong-lanceolate and clothed externally with long sparse hairs. *Petals* oblong-lanceolate, falcate, 3-nerved. *Lip* oblong with a sharp tooth at each side of the mouth of the sub-saccate base; the limb oblong entire, obtuse, the lamellæ scabrid. *Column* beaked. *Pollinia* elongate-obovate, with a short caudicle and a long narrow lanceolate pointed gland.

Sikkim: on Senchal; elevation 7,000 feet: flowering in July.

This differs from *G. vittata*, Benth., notably by its laxly hairy sepals, and by the scabrid lamellæ of the lip. Dedicated to Mr. W. B. Hemsley, F.R.S., formerly Assistant for India, now Principal Assistant, Herbarium, Royal Gardens, Kew.

GASTRODIA, R. Brown.

GASTRODIA DYERIANA, n. spec. Rhizome short, twice as thick as the stem, horizontal, with slender spreading roots. *Stem* about the thickness of a crow-quill, 12 to 15 in. long, bearing sheathing bracts .5 in. long at intervals. *Flowers* 3 or 4 near the apex of the stem, .5 or .6 in. long, brownish, nodding. *Sepaline tube* cylindrical, glabrous, the mouth 3-lobed. *Petals* minute, sub-rotund, entire, inserted on the sepaline tube near the bases of two of its sinuses. *Lip* as long as the column, but shorter than the sepaline tube, ovate-lanceolate, clawed, flat with undulate-crenate edges and with 4 parallel thickened lines from the base to nearly the tip: claw short, and bearing two sub-globular calli. *Column* with winged sides, the apex truncate and 4-toothed; *pollinia* narrowly and obliquely ovoid.

Sikkim: at elevations of 7,000 feet; flowers in August.

This is allied to *G. exilis*, Hook. fil., but that species has smaller

flowers with fimbriate (or glandular) lateral petals and a lip with 2 long wing-like central lamellæ. This is less closely allied to *G. orobanchoides*, Benth., which has erect flowers and a ventricose sepaline tube. It agrees with *G. elata*, Blume, in having two callosities on the claw of the lip. Dedicated to Mr. W. T. Thiselton Dyer, F.R.S., C.M.G., C.I.E., Director of the Royal Gardens, Kew.

Ophrydeæ.

HABENARIA, Willd.

HABENARIA BIERMANNIANA, n. spec. Height of plant 9 to 15 in.; tubers cylindric-ovoid, 1.25 in. long, sparsely hairy. *Leaves*, 4 or 5, cauline, scattered, amplexicaul, lanceolate, acute, boldly nerved, 2 to 3 in. long. *Spike* 4 in. long, rather sparsely flowered; bracts linear-lanceolate, acuminate, exceeding the sessile and scarcely beaked ovaries. *Flowers* .3 in. long. *Sepals* and *petals* sub-equal; *sepals* ovate, lanceolate, with oblique bases, concave, sub-acute, cohering and, with the triangular-lanceolate petals, forming a hood from the base of which the lip and spur projects. *Lip* fleshy, linear-oblong, tapering slightly to the obtuse apex, the side-lobes minute and tooth-like; spur about as long as the lip, curved, sub-obovate, dorsally compressed. *Column* arching over the mouth of the spur. *Caudicles* slightly shorter than the obovoid pollinia; gland short, linear-oblong.

Sikkim: on Sinchal; at an elevation of 8,000 feet: flowering in July.

A very distinct species dedicated to the memory of the late Adolf Biermann, for many years resident on the Government Cinchona Plantation in Sikkim, and who died as Curator of the Botanic Garden, Calcutta.

HABENARIA CUMMINSIANA, n. spec. Height of plant about 9 in. *Leaves* 2 to 4, unequal, crowded in the lower part of the stem with a smaller one a little below the spike, broadly elliptic to lanceolate, rather thick, 2 to 3 in. long and 1 to 1.5 in. broad. *Stem* angled between the small uppermost bract-like leaf and the base of the spike. *Spike* 3 in. long, rather densely-flowered, bracts longer than the slender beaked ovaries, their edges ciliolate. *Flowers* (to the tip of the spur) .75 in. long. *Dorsal sepal* ovate .25 in. long; the *laterals* narrower, wide-spreading, their edges ciliolate, .4 in. long. *Petals* fleshy, slightly exceeding the dorsal sepal, triangular, sub-falcate, the inner edge irregularly crenate near the base, the outer edge entire, the apex sub-acute, the base truncate. *Lip* very fleshy, without side-lobes, longer than the lateral sepals, almost cylindric, abruptly deflexed from the thin flattened base (? claw), the surface of the cylindric part slightly carunculate:

spur slender curved, longer than the ovary, slightly compressed laterally. *Column* very short: stigmas large, tapering towards the entrance to the spur. *Pollinia* cylindric, slightly clavate, rather longer than their caudicles and attached to them at half a right angle; gland small, subrotund.

Sikkim: at Gnatong; elevation 11,000 feet: flowering in July; collected by Mr. Pantling and also by Dr. Cummins; Surgeon to the detachment of troops stationed near the Thibet frontier, to whom we have dedicated the species.

This belongs to the section *Hologlossa* and is allied to *H. pachycaulon*, Hook. fil., but it is perfectly distinct from that species.

Contributions to the Theory of Warning Colours and Mimicry, No. I.
Experiments with a Babbler (Crateropus canorus).—By FRANK FINN,
 B.A., F.Z.S., Deputy Superintendent of the Indian Museum.

Not long after my arrival in Calcutta in October 1894, I commenced some researches on the common “warningly coloured” butterflies of the locality, in the hope of supplying some of that experimental proof of the unpalatability of such species, the insufficiency of which Professor Poulton (*the Colours of Animals*, p. 227) so justly deplures. My most complete experiments were made with the common Babbler *Crateropus canorus*, a representative and abundant insectivorous bird in India, whose habit of going about in small flocks is indicated by its native name of “sat-bhai” and the English ones of “Seven Brothers” and “Seven Sisters.” This bird, as it frequents trees and bushes, though often feeding on the ground in the open at a short distance from these, must constantly encounter butterflies in repose; that it often succeeds in capturing them on the wing I very much doubt, its weak clumsy flight being certainly most ill-adapted for such a performance. Though it can swallow whole butterflies of considerable size, it often transfers its prey to one foot, and thus holding it, easily picks off the wings. In confinement this species speedily becomes tame enough to feed from the hand, and will eat table scraps, boiled rice, &c., quite readily. So tame were some birds which I kept, that, when after being kept about a fortnight (some of them longer) they were released, they stayed about the compound for about three days, still willing to take insects from my hands. Thus I had an opportunity of checking the results of the experiments I had made on them during their incarceration—a piece of good fortune which has not so far, I believe, fallen to the lot of any previous experimenter.